

2 1. A method of producing an acoustic resonator device formed by a
3 piezoelectric material interposed between two conductors on a substrate,
4 comprising:
5 isolating said piezoelectric material to reduce the amount of acoustic energy
6 which propagates in a lateral direction away from the device.

1 3. The method of claim 1, wherein said isolation of said piezoelectric
2 material is performed after fabrication of the device.

1 4. The method of claim 1, wherein said step of isolating further includes
2 removing some or all piezoelectric material not involved in signal transmission after
3 device fabrication to limit lateral propagation losses to un-etched regions of the
4 device.

1 5. The method of claim 4, wherein said step of removing is performed
2 by a selective etching process.

6. The method of claim 1, wherein said step of isolating further includes limiting growth of piezoelectric material to specified regions on the substrate during fabrication, wherein said specified regions form isolated islands of said piezoelectric material which are subsequently interconnected, thereby limiting the creation or propagation of energy in lateral modes.

4 removing some or all piezoelectric material not involved in signal
5 transmission by transduction between RF and acoustic energy after device

[illegible]

6 fabrication to limit lateral propagation losses to un-etched regions of the device,
7 thereby limiting propagation of energy in lateral modes.

1 14. The method of claim 13, wherein said step or removing is performed
2 by a selective etching process.

1 15. The method of claim 14, wherein at least some of the substrate
2 surface is removed by selective etching.

1 16. The method of claim 13, wherein at least some of the removed
2 piezoelectric material forms a void which is back filled with a different material.

1 17. A method of isolating an acoustic resonator device having a
2 piezoelectric material interposed between two conductors on a substrate,
3 comprising:

4 limiting growth of piezoelectric material to specified regions on the substrate
5 during fabrication, wherein said specified regions form isolated islands of said
6 piezoelectric material which are subsequently interconnected.

1 18. The method of claim 17, wherein said isolated regions are formed by
2 a masking process.

1 19. A method of isolating an acoustic resonator device having a
2 piezoelectric material interposed between two conductors on a substrate,
3 comprising:

4 disrupting crystal orientation of the piezoelectric material during growth of
5 the piezoelectric material on the substrate by selectively patterning the surface of
6 the substrate prior to deposition of the piezoelectric material thereon, so as to form
7 regions of piezoelectric material where signal transmission is enhanced and regions
8 where signal transmission is degraded.

1 20. The method of claim 19, wherein some or all piezoelectric material
2 not interposed between the conductive films is in a region where signal
3 transmission is degraded, thereby performing an in-situ isolation function.

1 21. An acoustic resonator device, comprising:
2 a substrate;
3 a first conductive film formed on the substrate;
4 a piezoelectric material layer formed on the first conductive film, wherein
5 said piezoelectric material is isolated to reduce the amount of acoustic energy which
6 propagates in a lateral direction away from the device; and
7 a second conductive film formed on said piezoelectric layer.

1 22. The acoustic resonator device of claim 21, wherein any piezoelectric
2 material not involved in signal transmission is removed by selective etching to limit
3 lateral propagation losses to un-etched regions of the device.

1 23. The acoustic resonator device of claim 21, wherein said piezoelectric
2 material layer is limited to specified regions on said substrate and said first
3 conductive film, forming isolated islands of said piezoelectric material which are
4 subsequently interconnected.

1 24. The acoustic resonator device of claim 21, wherein the crystal
2 orientation of the piezoelectric material is disrupted during growth of said
3 piezoelectric material on the substrate by selectively patterning the surface of the
4 substrate prior to deposition of the piezoelectric material thereon, so as to form
5 regions of piezoelectric material where signal transmission is enhanced and regions
6 where signal transmission is degraded.

1 28. The acoustic resonator device of claim 21, wherein said substrate is
2 further comprised of at least a plurality of reflecting layers on a silicon wafer, or a
3 membrane.

add of B7

[illegible]